

miR-210 enhances the differentiation of USSCs into osteoblasts

Bone surgery as a current bone treatment method is not always successful to fulfil bone repair in bone degenerative diseases or extensive injuries. Due to the limited capacity of bone remodeling, the demand for alternative approaches remains to be met. Thus, efforts in ex vivo generation of bone forming cells, osteoblasts, and their further application in cell therapy as a promising approach are of vital prominence from a scientific perspective. Though several studies have focused on microRNA roles in osteoblast differentiation in various cell recourses, yet none has reported miR-210 enhancing role in human mesenchymal stem cells (MSCs) so far. Hence, we wished to examine the nature of the relationship between osteoblast differentiation and miR-210 in a unique human mesenchymal stem cells, unrestricted somatic stem cells (USSCs). Osteoblast markers at gene level namely, Runx2, col I in addition to osteocalcin were assessed using qRT-PCR, and Alizarin red S staining was also carried out to observe histochemical changes 7 days following miR-210 transduction. The conclusion that follows from our findings represents a marked increase in osteoblast differentiation markers. Interestingly, for the first time, human USSCs differentiation into osteoblasts was performed in our research. On the whole, our study may provide helpful insights into surmounting bone related issues by combination of both gene and cell therapy.

Key words: miR-210.Osteoblasts. Differentiation. USSC